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**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Regarding
Broadband Infrastructure Deployment and to
Support Service Providers in the State of
California.

Rulemaking 20-09-001
(filed September 10, 2020)

**REPLY COMMENTS OF THE UTILITY REFORM NETWORK ON
THE ASSIGNED COMMISSIONER'S RULING SEEKING COMMENT
FOR THE LOCATIONS FOR A STATEWIDE OPEN-ACCESS MIDDLE-MILE
BROADBAND NETWORK**

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TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	DISCUSSION	1
A.	ROUTE IDENTIFICATION SHOULD NOT BE LIMITED TO HIGHWAYS	2
B.	PRIORITIZATION OF IDENTIFIED STATE-OWNED MIDDLE MILE NETWORK PROJECTS	5
1.	<i>Statutorily-Required Prioritization Supports the Need for Analyzing High-Speed Broadband Availability</i>	<i>6</i>
2.	<i>Lateral Builds in Priority Analysis</i>	<i>9</i>
3.	<i>Need for Data Regarding Existing Middle Mile Before the Commission Can Prioritize.....</i>	<i>9</i>
C.	LEASING EXISTING MIDDLE-MILE NETWORK SERVICE FROM PRIVATELY-OWNED MIDDLE-MILE NETWORK PROVIDERS.....	13
1.	<i>Limited Circumstances for Leasing Existing Privately-Owned Middle-Mile Network</i>	<i>14</i>
2.	<i>Lease Arrangement Conditions for Leasing Existing Privately-Owned Middle-Mile Network</i>	<i>16</i>
D.	UNIQUE ISSUES RELATED TO URBAN AND DENSELY-POPULATED COMMUNITIES ..	18
E.	AFFORDABILITY	21
1.	<i>Affordability of Existing Privately-Owned Middle-Mile Access</i>	<i>22</i>
2.	<i>State-Owned Middle-Mile Affordable Rates</i>	<i>24</i>
3.	<i>Metrics To Determine What Is Affordable Middle-Mile Access.....</i>	<i>25</i>
F.	BUILDING THE STATE MIDDLE MILE NETWORK ONCE PRIORITY PROJECTS ARE IDENTIFIED	29
G.	THE STATE MIDDLE MILE PROJECT SHOULD LEVERAGE BROADBAND WORK UNDERTAKEN BY OTHER STATE AND LOCAL AGENCIES, BROADBAND CONSORTIA, TRIBES, AND BROADBAND PROVIDERS.	32
III.	CONCLUSION	36

I. INTRODUCTION

In accordance with the August 6, 2021, Assigned Commissioner’s Ruling Seeking Comment on the Locations for a Statewide Open-Access Middle-Mile Broadband Network,¹ The Utility Reform Network (TURN) submits these reply comments.

These comments follow the Assigned Commissioner’s issuance of a Second Amended Scoping Memo to add a third phase in this proceeding.² The third phase includes issues associated with the implementation of SB 156.³ In response to SB 156, the Assigned Commissioner requests comment as the Commission works to prepare a report on the locations for, and other information related to, a state-owned middle-mile network for the California Department of Technology’s Office of Broadband and Digital Literacy.⁴

II. DISCUSSION

These comments respond to the many proposals from parties regarding the questions posed by the Commission as it strives to carry out its legislative mandate to identify the locations for consideration in the State’s vital work to tackle the need for adequate middle-mile service to meet California’s needs. As part of its analysis, the Commission will review existing middle-

¹ Assigned Commissioner’s Ruling, R.20-09-001 (August 6, 2021). The statute defines “statewide open-access middle-mile broadband network” to mean broadband infrastructure that is funded pursuant to Item 7502-062-8506 of the Budget Act of 2021. SB 156, Chap. 112 July 20, 2021, Section 3, Gov. Code § 11549.54. For the sake of clarity, TURN refers to this SB 156 funded network as the state-owned middle-mile network, and TURN refers to all other middle-mile network as privately-owned middle-mile networks.

² Second Amended Scoping Memo, R.20-09-001 (August 2, 2021).

³ SB 156, Chap. 112 July 20, 2021, Section 3, Gov. Code § 11549.54.

⁴ Assigned Commissioner’s Ruling at 4-7. Throughout these comments, the California Department of Technology’s newly established Office of Broadband and Digital Literacy pursuant to Gov Code § 11549.51, will be referred to as the “Office of Broadband and Digital Literacy.”

mile networks to determine whether these networks support broadband access at sufficient speeds, on an “open-access” basis, and offered to last-mile service providers at affordable rates.⁵ TURN’s comments analyze the concept of affordability and urge adoption of specific prioritization criteria in this context. These comments address the need to build the state-owned middle-mile network effectively and efficiently, leveraging state resources with work undertaken by regional and local initiatives, and leasing arrangements with existing privately-owned networks as appropriate. At this point, there is insufficient data on the locations of existing middle mile infrastructure, the rates, terms, and conditions for access to existing middle-mile networks, and the needs of local communities, for the Commission to prepare its report to the Office of Broadband and Digital Literacy. TURN urges the Commission to obtain the data necessary to complete this task. Further, these comments address the unique issues facing densely populated areas that should be considered as the Commission evaluates the data to present its analysis. Following from this, TURN addresses issues associated with the construction and operation of the state-owned middle-mile network.

A. Route Identification Should Not be Limited to Highways

The statute directs the Commission to identify priority statewide open-access middle-mile network broadband locations, including "areas with no known middle mile network access...."⁶ Moreover, the statute also directs the Commission, in collaboration with relevant stakeholders, to identify state highway rights-of-way where installations of middle-mile broadband infrastructure

⁵ Gov. Code § 11549.54.

⁶ SB 156, Gov. Code § 11549.54 (b) and (c).

can be prioritized.⁷ As part of the Commission's mandate, the Assigned Commissioner's Ruling sought comment on a list of routes proposed for the state-owned middle-mile network project.⁸

The proposed routes are situated along highways.

Some parties suggest that limiting the state-owned middle-mile network project solely to highways would mean that many unserved and underserved communities would continue to lack access to middle-mile network services, and consequently, lack access to last-mile broadband and essential telecommunications services.⁹ These unserved and underserved communities are predominantly rural and include Tribal lands and important institutions that serve public safety needs. Therefore, some parties suggest that the Commission and the Office of Broadband and Digital Literacy consider including routes along roads that are not highways but serve communities that have no or extremely limited middle-mile service. Mono County describes such routes as "lateral builds,"¹⁰ and TURN will use that term in this discussion.

Including routes involving lateral builds for consideration as eligible priority projects provides an opportunity for the State to coordinate with regional transportation and broadband planners. This coordination could facilitate leveraging knowledge, resources, and construction projects to extend service to hard-to-serve areas in a cost-effective manner that can be used by multiple providers that will reach farther into the community through last-mile facilities. For example, the San Diego Association of Governments (SANDAG) suggests that the CPUC should

⁷ SB 156, Gov. Code § 11549.54 (e).

⁸ Assigned Commissioner's Ruling at 4.

⁹ See Mono County Opening Comments at 3-4; San Diego Association of Governments (SANDAG), Opening Comments at 5-6; Rural County Representatives of California (RCRC) Opening Comments at 4; Yurok Tribe Opening Comments at 4.

¹⁰ Mono County Opening Comments at 1 (explaining lateral builds).

consider leveraging local roads in addition to the state highway system, and explains that SANDAG is currently working with CalTrans, County of San Diego, and SDG&E to identify other local roads and utility projects that could support middle-mile network connections.¹¹

The record contains several examples of proposed middle-mile routes that would follow county roads, rather than state or federal highways. For example, Mono County describes a situation where a state-owned middle mile route could be deployed along a local road that connects to Highway 395, served by the Digital 395 project. In this instance following a county road and using municipally owned rights of way to reach communities could reduce costs for the state-owned middle-mile network.¹² By doing so, the work completed for the state-owned middle-mile network project could also leverage prior work completed in Mono County to construct the Digital 395 project. This leveraging of resources and work completed would add more value to the Digital 395 project because Digital 395 would serve more customers and anchor institutions.

The Yurok Tribe provides an additional example. The Yurok Tribe suggests a route along a road that connects two highways. This route would not only allow the Tribe to partner with the State to provide last-mile service to unserved Tribal members, the route would also significantly enhance public safety communications in a high fire threat area.¹³

A lateral build may also provide a partial solution to extending middle-mile network service to the pockets of unserved and underserved communities in urban areas, such as those

¹¹ SANDAG Opening Comments at 5.

¹² Mono County Opening Comments at 4.

¹³ Yurok Tribe Opening Comments at 4.

identified by the California Community Foundation.¹⁴ The California Community Foundation identifies instances where proposed highway routes along US Highway 10 and State Highway 110 would bypass black and brown communities with low subscription levels for broadband offered at speeds of 25/3 Mbps.¹⁵ Below, TURN discusses the prioritization of routes for the state-owned middle mile network, including further discussion of the possible use of lateral builds to extend the network's reach.

TURN suggests that as the Commission analyzes the responses to the Assigned Commissioner's Ruling, that it consider lateral builds as possible routes. The statute does not preclude considering lateral builds as possible priority routes and, as explained below, these routes can be very beneficial to meeting the overarching goal of a state-owned middle-mile network project.

B. Prioritization of Identified State-Owned Middle Mile Network Projects

TURN acknowledges the Commission's challenging task to prioritize projects to establish state-owned middle-mile network service to areas that needed it most throughout the geographically diverse areas in California. This section responds to the Commission's approach to fulfill its duty under SB 156, including using lateral builds, to identify and prioritize, and then calls for more middle-mile network and service information.

¹⁴ California Community Foundation (CCF) Opening Comments at 9.

¹⁵ *Id.*

1. Statutorily-Required Prioritization Supports the Need for Analyzing High-Speed Broadband Availability

The Assigned Commissioner's Ruling provides a map of areas under consideration for state-owned middle-mile deployment and bases this consideration on whether households have last-mile access to 100 Mbps service.¹⁶ Some commenters criticize the Commission for exceeding SB 156 minimum parameters. These parties argue that the Commission is precluded from identifying potential middle-mile routes where available household speeds exceed the 25 Mbps download/ 3 Mbps upload speeds set forth in the statute.¹⁷ Moreover, some of these parties claim that California has near ubiquitous access to last-mile networks that deliver broadband speeds of at least 100 Mbps download.¹⁸ TURN disagrees with those commenters and supports the Commission's approach in the Assigned Commissioner's Ruling.

Parties are correct that SB 156, codified in the Government Code, requires the Commission to identify priority middle-mile locations that enable the availability of broadband to residences unserved by 25 Mbps downstream and 3 Mbps upstream.¹⁹ At the same time, the Government Code does not preclude the Commission from analyzing routes that exceed the 25 Mbps download/ 3 Mbps upload minimum parameter.²⁰ Indeed, the statute specifically allows

¹⁶ Assigned Commissioner's Ruling at Attachment 1.

¹⁷ Gov. Code §11549.54. *See also, e.g.*, Comcast Opening Comments at 3-4; Small LECs Opening Comments at 3; CCTA Opening Comments at 4.

¹⁸ Comcast Opening Comments at 1-2; CCTA Opening Comments at 8. *See also*, generally, Charter Opening Comments.

¹⁹ Gov. Code §11549.54(d) ("In identifying priority statewide open-access middle-mile broadband network locations pursuant to subdivision (c), the commission shall prioritize locations that enable last-mile connections to residences unserved by 25 Mbps downstream and 3 Mbps upstream"). *See also*, Senate Rules Committee, Office of Senate Floor Analyses, SB 156 Committee on Budget and Fiscal Review, Amended 7/11/21, at 2.

²⁰ *See generally*, Gov. Code §11549.54.

the Commission to include priority routes that serve anchor institutions that “lack sufficient high-bandwidth connection”.²¹ One goal of the statute is to achieve the greatest reduction in the amount of households unserved by broadband service meeting federal and state standards.²² Currently, the California broadband internet access service standard for last-mile network deployments funded by the California Advanced Services Fund (CASF) is 100 Mbps download/ 20 Mbps upload.²³ Therefore, it is entirely appropriate for the Commission to identify households that do not currently have access to 100/ 20 Mbps when analyzing the need for middle-mile infrastructure. Moreover, as discussed further below, the claims of ubiquitous last-mile network access at speeds over 100 Mbps cannot be taken at face value because parties rely on data that are known to overstate broadband service availability and often represent advertised speeds and not actual service levels.

Another input into the prioritization analysis is the Legislative direction that the state-owned middle-mile infrastructure deployment must “enable last-mile connection,”²⁴ but this consideration requires careful analysis. First, it is important to confirm whether the lack of last-mile availability is due to a lack of affordable, open-access middle-mile infrastructure with sufficient capacity, or whether it is due to other factors. TURN agrees with parties that California should not build the equivalent of a broadband “bridge to nowhere,”²⁵ yet TURN does

²¹ Gov. Code §11549.54(d). *See also*, CVIN Opening Comments at 4.

²² Gov. Code §11549.54(b) and (e)(1). *See also* LCB Opening Comments at 11 (stating “[t]he State must keep in mind that it is just not building for today’s population and bandwidth demand, but the State’s long-term future and the increasing bandwidth demands for a few decades”).

²³ Pub. Util. Code § 281(f)(5). *See also* MCI Metro Opening Comments at 6-7; GeoLinks Opening Comments at 5-6; U.S. Telecom Opening Comments at 1-2.

²⁴ Gov. Code §11549.54(d).

²⁵ *See e.g.*, Small LECs Opening Comments at 1.

not understand the Assigned Commissioner's Ruling to suggest that Commission would recommend this. These comments respond to two proposals. TURN opposes AT&T's suggestion that state-owned middle-mile construction should only be allowed where last-mile facilities currently exist or are currently planned to be deployed. This misses the mark. To adopt AT&T's proposal would fail to address the lack of last-mile access in areas that are not currently served or are not currently planned to be served, a perpetual problem SB 156 specifically seeks to resolve. Instead, the State must balance deploying middle-mile infrastructure to areas that are completely unserved by broadband with building the state-owned network to serve areas that are underserved by broadband.

Additionally, TURN opposes Comcast's staged approach to build to completely unserved communities before considering underserved communities,²⁶ because the State should not wait to build middle-mile infrastructure where there are sufficient funds to do so now. Californians have waited long enough for ubiquitous robust broadband service and the lack of adequate middle-mile networks and service should not continue to cause delays.

Therefore, TURN supports the Commission's inquiry set forth in the Assigned Commissioner's Ruling as it complies with the prioritization requirements set forth in SB 156, which do not preclude identifying communities for which service is unavailable at speeds of at least 100/ 20 Mbps. If the state of existing open-access middle-mile infrastructure is so inadequate that California does not have sufficient funds to deploy middle-mile to reach all communities that do not have access to 100/ 20 Mbps, then the Commission must recommend that the State focus the initial efforts on deploying state-owned middle-mile infrastructure to

²⁶ Comcast Opening Comments at 3.

communities that do not have access to 25/ 3 Mbps. If, however, deploying middle-mile infrastructure to communities that do not have access to 25/ 3 Mbps will not deplete the funds, the Commission should also recommend deploying state-owned middle-mile infrastructure to communities that do not have access to last-mile service of 100/ 20 Mbps, especially if these communities can easily be reached by lateral middle-mile deployments. However, as discussed further below, this next step in the analysis will require that the Commission to has adequate data regarding existing middle mile infrastructure to identify gaps in middle mile access.

2. Lateral Builds in Priority Analysis

Although TURN supports the general focus on state highway routes for the state middle-mile network, as discussed above the Commission should consider prioritizing some routes along non-highway roads (“lateral builds”) when they are the best or only means of providing middle-mile service to communities that do not receive at speeds of at least 25/3 Mbps. The CPUC and the Office of Broadband and Digital Literacy should work with regional agencies, Tribes, broadband providers, electric utilities, and other stakeholders to identify ways in which these state-owned middle-mile network projects can be leveraged with other resources and infrastructure projects so that, if selected, they can be constructed in the most efficient, cost-effective manner possible. This is especially true with these lateral routes that may be shorter or serve harder to reach areas. As discussed above in the previous section, including lateral build projects among priority routes can be an efficient way to address pockets of unserved or underserved customers whose needs might otherwise be unmet.

3. Need for Data Regarding Existing Middle Mile Before the Commission Can Prioritize

The areas the Commission will recommend for state-owned middle-mile deployment will necessarily depend on how many areas in California need core or lateral middle-mile

deployments to enable access to last-mile broadband services. One indicator of inadequate middle-mile is the lack of available high-speed broadband to a community. The Commission requires accurate data about available speeds in order to conduct its analysis, and has used the best data currently available to identify households that can receive broadband at speeds of 100/20 Mbps or less. Unfortunately, the data currently available from the Commission and the Federal Communications Commission (FCC) is not adequate to support the necessary analysis.

The broadband maps prepared by both the FCC and the Commission overestimate broadband service availability because they each designate an entire census block as “served” if one location in that census block has access to broadband service that meets federal or state minimum broadband speeds.²⁷ Hypothetically, if a census block contains 100 locations but only a single location has access to broadband that meets the minimum broadband speeds, the FCC’s and the Commission’s broadband maps would indicate that all 100 locations have access to broadband when in reality 99 locations do not. Both the FCC and the Commission have grappled with the overstatement of broadband access using this one-per-census-block standard. The FCC recently revised its definition of “served” for the purposes of its broadband map, but that new definition does not fully resolve the overstatement of broadband availability.²⁸ This

²⁷ See e.g., Pub. Util. Code §281(b); Fixed Broadband Deployment Data from FCC Form 477, retrieved from <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477> (last viewed September 20, 2021) (“Fixed providers file lists of census blocks in which they can or do offer service to at least one location. . .”).

²⁸ See e.g., FCC, “Broadband Data Collection,” updated August 25, 2021, retrieved from <https://www.fcc.gov/BroadbandData> (last viewed September 20, 2021) (“The FCC is in the process of updating its current broadband maps with more detailed and precise information on the availability of fixed and mobile broadband services”).

Commission has also grappled with the overstatement of broadband availability in the CASF proceeding.²⁹

Moreover, the Broadband Availability Map is not necessarily up-to-date, as carriers may choose to wait to provide the Commission with updated information as part of a CASF challenge process, which occurs only after a CASF application has been submitted for a last-mile project proposal.³⁰ While there is yet to be a good solution to depict the availability of last-mile broadband throughout California, last-mile providers should have the burden to accurately inform the Commission about the areas served by their networks or risk competition from overbuild.

In opening comments, several providers stated they would be willing to provide detailed information about their middle-mile infrastructure if the Commission would keep that information confidential.³¹ However, it does not appear that any provider filed a confidential version of their opening comments to include detailed information about their existing privately-owned middle-mile infrastructure. Some providers suggest that middle-mile owners may not be under the Commission's jurisdiction and have no obligation to submit their route data to the Commission.³² While TURN does not necessarily agree with these parties assertions regarding

²⁹ See e.g., D.18-12-018 (R.12-10-012) at 8-12 ("It is clear that, in certain instances, the deployment data submitted by providers overstates broadband availability and that the submitted data is inaccurate in other ways We note that the FCC and United States Department of Agriculture (USDA) are also wrestling with this issue").

³⁰ See e.g., D.18-12-018 (R.12-10-012) at 31 ("The more complicated scenario is if an application receives a challenge and the applicant and challenger are unable to agree to terms for wholesale service. . . . We have heard of allegations that a provider challenged an application and then declined to offer any service").

³¹ See e.g., Race Opening Comments at 4.

³² See e.g., Cox Opening Comments at 4; Frontier Opening Comments at 2; US Telecom Opening Comments at 1, 3-4.

the Commission’s authority over middle mile providers, at a minimum, the Commission has subpoena powers and should use that authority to the fullest extent possible to ensure it has a complete picture regarding the state of middle-mile network access in California.³³ If the Commission has not done so already, TURN recommends the Commission serve a data request on all certificated middle-mile providers in California so that the Commission can compile a more accurate map of the locations of existing middle-mile, as well as the interconnection points along those routes. The Commission should work with other state, regional and municipal agencies to obtain information about their middle-mile network facilities so that it has the most complete understanding possible of the location of these facilities throughout California. With this data in hand, the Commission can then more effectively consult with other state and federal agencies regarding existing middle-mile infrastructure.³⁴

After that initial review of the state of existing middle-mile infrastructure and interconnection points, TURN recommends the Commission analyze where the lack of last-mile broadband at 25/ 3 Mbps and 100/ 20 Mbps is caused by inadequate open access middle-mile offered at affordable rates and sufficient capacity. TURN agrees with parties who suggest the Commission serve a data request on middle-mile owners to obtain their existing contracts so the Commission can determine whether those terms meet the letter and spirit of California’s open

³³ CA Constitution, Article XII, Sec. 5.

³⁴ See AB 41 (2021, Wood), retrieved from https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB41 (last viewed September 20, 2021) (submitted to Engrossing and Enrolling on September 10, 2021, with a vote of 76-0) (adding Pub. Util. Code §281.6(a) (“The commission, in collaboration with relevant state agencies and stakeholders, shall maintain and update a statewide, publicly accessible, and interactive map showing the accessibility of broadband services in the state . . .”). See also, e.g., Frontier Opening Comments at 2.

access needs.³⁵ If the Commission finds that a middle-mile owner's terms do not currently meet the letter and spirit of California's open access needs, the Commission should give those existing middle-mile owners an opportunity to meaningfully commit to offering open access middle-mile services in the future. Giving the existing middle-mile owners an opportunity to bring their terms into open access compliance could make those existing middle-mile infrastructure more accessible to communities who do not currently receive last-mile 25/ 3 Mbps and 100/ 25 Mbps service, and will allow the Commission to focus its recommendations for middle-mile deployment where no middle-mile exists and where existing infrastructure is insufficient to meet California's needs.

C. Leasing Existing Middle-Mile Network Service from Privately-Owned Middle-Mile Network Providers

In its efforts to identify routes for its report to the Office of Broadband and Digital Literacy, the Commission requests comments about the value and cost-effectiveness of leasing arrangements to serve the state-owned middle mile network needs.³⁶ TURN supports leasing arrangements under limited circumstances with several considerations discussed here and in opening comments.³⁷

³⁵ See e.g., GeoLinks Opening Comments at 6; Race Opening Comments at 4. See also, TURN Opening Comments at 9-10.

³⁶ Assigned Commissioner's Ruling, R. 20-09-001 at 6, see also Gov. Code § 11549.54.

³⁷ TURN Opening Comments at 11-13.

1. Limited Circumstances for Leasing Existing Privately-Owned Middle-Mile Network

In opening comments, some parties favor the State leasing capacity on privately-owned networks as compared to building a new state-owned middle-mile network because of overbuilding and competition concerns.³⁸ Other parties suggest that a leasing arrangement of privately-owned middle-mile networks would only be acceptable for temporary purposes³⁹ or as part of an effort to coordinate with local leaders.⁴⁰ Several parties disagree that funds should be spent on leasing privately-owned networks and strongly support building new state-owned middle-mile network routes.⁴¹ There are others like, LCB that oppose a state-leased middle-mile network but suggest that the State obtain commitments from existing privately-owned middle-mile network providers to give preferential rates that would be in-line with the rates offered by a state-owned middle-mile network.⁴² The California Cable and Telecommunications Association

³⁸ CVIN Opening Comments at 9; Frontier Opening Comments at 8; Small LECS Opening Comments at 3; Lumen Opening Comments at 5. Electronic Frontier Foundation (EFF) notes that funding should not support redundant open-access fiber construction if that infrastructure is already available at affordable rates and sufficient capacity. EFF Opening Comments at 6. *See also* US Telecom Opening Comments at 5 (expressing concern for the reason for leased middle mile services on open access middle mile networks).

³⁹ California State Association of Counties (CSAC) Opening Comments at 4 (temporary use of leased middle mile coupled with a plan to replace the use of leased middle mile networks with state middle mile network).

⁴⁰ Santa Clara County Opening Comment at 8.

⁴¹ Los Angeles County Economic Development Corporation (LAEDC) Opening Comments at 11 (explaining that leasing spends funds for a limited-term solution rather than a permanent solution, and bypasses the chance to build more redundancy and resiliency with a separate yet parallel path). The North Bay North Coast Broadband Consortium offers a proposal where to work with the middle mile network providers to determine whether to lease or build middle mile service and is supporting of creating competition. North Bay North Coast Broadband Consortium (NBNCBC) Opening Comments at 10. Yolo County prefers building rather than leasing middle mile network service. Connected Capital Area Broadband Consortium (CCABC) Opening Comments at 8. The RCRC does not support leasing existing middle mile infrastructure for rural areas given the telecommunication outages in the areas and an observation that many rural areas lack redundant systems. RCRC Opening Comments at 4.

⁴² LCB Opening Comments at 8.

(CCTA) suggests that this set of questions is outside of the Commission's scope pursuant to the statute because it argues that the leasing questions relate to the Office of Broadband and Digital Literacy's responsibility to operate the state-owned middle mile network and are outside of the Commission's duty to seek comment about the potential locations for this network;⁴³ TURN disagrees. Since part of the Commission's effort to identify and prioritize locations is to analyze the needs of the local community, the opportunity to lease capacity on an existing network is clearly part of the analysis set forth in the statute.⁴⁴ As further discussed below, even under a leasing arrangement, middle-mile network service and capacity should be reliable, and the capacity of the leased infrastructure serving an identified priority area should account for future needs.

Therefore, TURN supports leasing privately-owned middle-mile network capacity under the following limited circumstances and conditions.⁴⁵ As an initial matter, a network assessment of the areas' middle-mile service needs should be completed to determine the public safety capacity needs, for example whether diverse middle-mile network routes are needed to account for wildfire impact.⁴⁶ Moreover, leased privately-owned middle-mile networks should be

⁴³ CCTA Opening Comments at 10. AT&T makes a similar statement but then notes the benefits of leasing middle mile network service and said that it would expect that the state would be able to lease existing middle mile network much faster than building its own network. AT&T Opening Comments at 10.

⁴⁴ Gov. Code § 11549.54.

⁴⁵ TURN notes that some commenters suggested several models to lease middle mile network service. *See e.g.*, SANDAG Opening Comments at 10-11. Southern California Association of Governments suggests a number of conditions, such as data usage cap prohibitions, maintenance, and emerging technology integration. Southern California Association of Governments (SCAG) Opening Comments at 10.

⁴⁶ CSAC Opening Comments at 4 (suggests that construction of state middle mile network will provide redundancy and aid in competition instead of leasing). Race Opening Comments at 4-5 (favoring leasing to leverage existing infrastructure without overbuild, except when needed to build a secondary

considered only for short distances to reach priority areas⁴⁷ and not as part of a core middle-mile infrastructure. In some settings, a short-distance segment of leased privately-owned middle-mile network service may be cost-effective and faster to arrange than new state-owned middle-mile network construction.⁴⁸ This may be especially the case for urban settings where to add infrastructure, construction may be complicated, or space may be limited.⁴⁹

2. Lease Arrangement Conditions for Leasing Existing Privately-Owned Middle-Mile Network

If a leased arrangement is appropriate for portions of a state-owned middle-mile network in a given priority area, the arrangements should be limited to privately-owned available middle-mile network service with specific conditions. In a leased arrangement, the privately-owned middle-mile network must allow open access for the nearby last-mile service providers (either communications carriers, Internet Service Providers or publicly owned and operated last-mile networks); offered by the State with affordable rates for the middle-mile network service, and with well-maintained infrastructure. The State must be able to offer services through this leasing arrangement that adequately serve the needs of the priority area and meet the goals of the statute. Moreover, TURN supports calls for the State to consider a solution that supports the middle-mile-network service needs for Tribes, both at the initial lease arrangement and thereafter.⁵⁰

redundancy path because geography presents limited paths). SANDAG suggests several models that include outcome-based performance measures or terms that outline technology refresh cycles for service quality and capacity purposes. SANDAG Opening Comments at 11.

⁴⁷ See e.g., CVIN Opening Comments at 7.

⁴⁸ Small LECs Opening Comments at 3.

⁴⁹ City and County of San Francisco (San Francisco) Opening Comments at 3-4.

⁵⁰ Yurok Tribe Opening Comments at 9.

If California leases privately-owned middle-mile network service, the leased capacity should not be limited to the priority area's current base level capacity needs, and instead should have some room for growth.⁵¹ However, before the State acts to renew lease arrangements, the terms must be reviewed to assess that the leased service capacity meets the priority area's foreseeable middle mile capacity needs.⁵²

Similarly, any lease agreements between the State and privately-owned middle mile network providers in fulfillment of the statute should include incentives to encourage maintenance and upgrades⁵³ on the privately-owned middle-mile network so that the State does not fund deteriorating networks. This strengthens the State's ability to ensure to last mile service providers that the State's middle mile service offered will be reliable and resilient. One method to achieve this is to ensure that the lease arrangements with privately-owned middle-mile network providers secures the State's ability to upgrade electronics attached to leased dark fiber.

Other parties suggest different considerations for a leased arrangement between the State and privately-owned middle-mile network provider. CVIN notes that bandwidth availability is not limited to fiber strands, rather the electronics connected to the fiber also determine capacity.⁵⁴ SCE suggests that a lease contract include the needed number of strands with an ability for the

⁵¹ EFF Opening Comments at 7. EFF offers suggestions for the State to partner with leased middle mile service provider at the appropriate time and jointly expand the current network through financing the new fiber strands. EFF explains that these strands would be publicly owned and jointly available as capacity needs grow. EFF Opening Comments at 7. Race Opening Comments at 5 (noting that consumer data needs rise every year and it is hard to predict technological changes in 20 to 30 years, the typical length of the IRU lease).

⁵² CVIN Opening Comments at 10. GeoLinks suggests for middle mile network providers to show their current capacity and explain their ability to add additional capacity. GeoLinks Opening Comments at 8-9.

⁵³ Yurok Tribe Opening Comments at 9; *see also* SCE Opening Comments at 15.

⁵⁴ CVIN at 10. Lumen offers a similar explanation, "opto-electronics can be upgraded to an almost infinite amount of capacity using existing fiber cables." Lumen Opening Comments at 6.

State to expand the strand-count at a fixed rate.⁵⁵ Ultimately, TURN recommends that any state lease of privately-owned middle-mile network service include incentives to encourage maintenance and upgrades such as upgrading electronics and increasing fiber strand counts as needed.

D. Unique Issues Related to Urban and Densely-Populated Communities

The Commission is tasked to prioritize state highway rights of way for the installation of state middle mile network facilities, and in this process, it must prioritize a “geographically diverse group of projects in rural and urban areas of the state to achieve the greatest reductions in the amount of households unserved” by last-mile service providers that meet federal and state standards.⁵⁶ Because the Commission is specifically tasked with reviewing projects in both rural and urban settings, the presence of current open access middle mile at affordable rates and with sufficient capacities in all parts of the state, must be examined critically. TURN agrees with parties that are critical of the proposed routes in the ruling because the list overlooks key urban areas.⁵⁷ Moreover, for an enhanced community impact picture, TURN agrees that the Commission should consider both the percentage of unserved households and the absolute number of unserved households, and should calculate these figures with data that is more granular than county level reporting.⁵⁸ In the data and maps available for densely populated

⁵⁵ SCE Opening comments at 15.

⁵⁶ Pub. Util. Code §11549.54(e)(1).

⁵⁷ LAEDC Opening Comment at 6-7 (explaining that the maps used do not include underserved segments in the CA-110 and US-101 corridors and this leaves out pockets that should be included); SANDAG Opening Comments at 5-6; City of Los Angeles Opening Comment at 3-4.

⁵⁸ Los Angeles County Opening Comments at 5 (explaining that the percentage alone may not be an accurate reflection of disproportionately high number of unserved households); Santa Clara County Opening Comments at 7.

areas, significant numbers of unserved households can go unnoticed because their presence gets lost in the seemingly high percentage of “served” populations presented. These pockets of unserved neighborhoods and communities may be unserved by last mile service because of a lack of affordable or robust middle-mile network service.⁵⁹ Moreover, as discussed above, the Broadband Availability Map masks these unserved areas with data that overstates the availability of last-mile broadband services.⁶⁰ Instead, TURN agrees with parties that suggest the Commission should review household data at granular levels, for example using US Census Bureau Public Use Microdata Areas (PUMAs), because such a granular review will help pinpoint the root cause(s) of the lack of available last-mile broadband service and better ensure that communities do not continue to slip through the cracks of the digital divide.⁶¹

Therefore, for the reasons stated above, the Commission should look closely at unserved households in densely populated areas. To do so, the Commission may review the submitted suggestions regarding the methodology and data necessary in parties’ opening comments in phase III,⁶² or the Commission can leverage information and analysis previously submitted in

⁵⁹ Yurok Tribe notes the issue experienced by some tribes where the surrounding area is considered served but the tribe is not. Yurok Tribe Opening Comments at 7.

⁶⁰ California Interactive Broadband Map, available at <https://www.broadbandmap.ca.gov/> (last viewed September 21, 2021).

⁶¹ See e.g., CCABC Opening Comments at 6. TURN also acknowledges that parties provided various methodologies to ascertain the areas to target. See e.g., Committee for Greater Los Angeles Opening Comment at 5-6; SCAG at 9 and note 9 (referencing resource of California cities that have conducted digital equity studies); SANDAG Opening Comments at 5-6, 8-9; Los Angeles County Opening Comments at 4 (suggesting block level data); NBNCBC Opening Comment at 8.

⁶² Los Angeles County Opening Comments at 6; LAEDC Opening Comment at 6-7.

this proceeding such as the comments and data submitted in Phase II-B for digital redlining.⁶³

These resources may help identify some pockets that the current maps would miss, because identifying current areas with only last-mile low-speed offerings⁶⁴ may reflect the lack of commercial middle-mile network service with sufficient capacity and/or affordable rates for last-mile providers. In line with its commitments to address equity issues in ESJ communities, the Commission can recognize the historical underpinnings of Digital Redlining that may cause these communities to be underserved by adequate middle mile and last mile infrastructure and service, and as part of this work to prioritize routes, can address larger infrastructure problems plaguing ESJ communities in some urban, suburban, or rural settings. State middle-mile network services may be necessary in areas where ESJ communities reside and do not provide the business incentive for investment by privately-owned middle-mile network providers.⁶⁵ Through this analysis the Commission can decrease the risk of inadvertently “baking into the new middle-mile investments” the Digital Redlining that it is working to redress.⁶⁶

⁶³ See e.g., TURN July 2, 2021 Opening Comments; TURN July 26, 2021 Reply Comments; Cal Advocates July 2, 2021 Opening Comments; Cal Advocates July 26, 2021 Reply Comments; Center for Accessible Technology (CforAT), EFF, and Public Knowledge (PK) July 2, 2021 Opening Comments.

⁶⁴ See e.g., Cal Advocates Opening Comments at 3; CCABC Opening Comments at 5-6 (Yuba County suggests actual speeds provided instead of advertised by last mile providers).

⁶⁵ Some parties raised this issue in this phase as well. LAEDC Opening Comment at 5-6 (explaining that the lack of open-access middle mile network service has prevented the extension of last mile service into digital redlined areas).

⁶⁶ Committee for Greater Los Angeles Opening Comment at 7-13 (providing a case study of a section of an area that by some maps show as served but with additional granular level reflect pockets that lack sufficient service).

E. Affordability

The Legislature directs the Commission to identify open-access middle-mile broadband network locations where there is “no known middle-mile infrastructure that is open access, with sufficient capacity, *and at affordable rates.*”⁶⁷ The statute does not explicitly define the term “affordable rates,” and so it is reasonable to interpret this term using the language and intent of the statute. The statute requires that the state-wide middle-mile network allow for “affordable” last-mile service and “facilitate high-speed broadband service” to households, Tribes, and anchor institutions such as schools, healthcare institutions, and public safety entities.⁶⁸ The statute also requires that the Commission take comment and review information regarding the design and operational considerations that will “increase the attractiveness and usefulness of the statewide open-access middle mile network,”⁶⁹ and requires that there to be a “variety of services offered to internet service providers or other eligible entities”⁷⁰ over this statewide network. These considerations must be included in the analysis to design “affordable” access to this state middle-mile network. The middle-mile network must, more generally, support “sufficient high-bandwidth connections” and shall be designed to “achieve the greatest reductions in the amount of households unserved by broadband internet access service meeting federal and state standards.”⁷¹ Therefore, TURN urges the Commission to consider “affordable access” to state-owned middle-mile network through the lens of facilitating end user last mile access. TURN

⁶⁷ Gov. Code §11549.54(b) (emphasis added)

⁶⁸ Gov. Code §11549.52 (a)

⁶⁹ Gov. Code §11549.54(f)(1)(B).

⁷⁰ Gov. Code §11549.57(b).

⁷¹ Gov. Code §11549.54(d), (e)(1).

agrees with UCAN that, “Ultimately, the goal is not simply to deploy infrastructure, but rather to increase the ability of households of all incomes and geographies to become digitally connected.”⁷² The Commission must avoid the scenario where last-mile providers still will not serve unserved communities because the middle-mile rates are too high to make the last-mile service economical.⁷³ As discussed further below, the Commission must review middle-mile affordability in different ways. It must determine the affordability of existing middle-mile network services to determine if a state-owned middle-mile network is necessary,⁷⁴ it must set the affordability of access to state-owned middle-mile network services, and it must consider and the impact of increased access to middle mile capacity on creating affordable last mile end-user broadband access services.⁷⁵

1. Affordability of Existing Privately-Owned Middle-Mile Access

The Legislature charged the Commission with identifying and prioritizing areas for placement of state middle mile network facilities where existing privately-owned middle-mile access is unaffordable. However, carrier comments fail to provide sufficient information or data that would allow the Commission and other state agencies to determine whether existing rates for

⁷² Utility Consumer Action Network (UCAN) Opening Comments a 5.

⁷³ UCAN Opening Comments at 5; *see also* CCF Opening Comments at 3-4 (lack of open access fiber prevents competition from producing affordable rates to allow others to offer affordable end user services).

⁷⁴ NBNCBC Opening Comments at 5, 9 (middle mile access rate should allow last mile providers to offer end user services at \$15 a month).

⁷⁵ Corporation for Education Network Initiatives in California (CENIC) notes a broad array of services that could fall into this category. CENIC Opening Comments at 3-4.

privately-owned middle-mile access *are* “affordable.”⁷⁶ For example, Verizon suggests that one of the goals of the statute is to develop “commercially reasonable rates” for middle-mile and that there should be a “reasonable” return on investment and no consideration of “scarcity based” pricing methods.⁷⁷ As discussed above, the carriers also claim that there is sufficient competition for middle mile network services and that this competition will keep rates affordable.⁷⁸ These carriers seem to miss the point that the existence of middle-mile routes does not necessarily translate to meaningful and affordable middle mile access or last-mile access to high speed broadband for online learning, work, and community involvement. This Commission has previously found that the market for middle mile network services is not competitive leading to frequent complaints about pricing for backhaul and other services and expensive and inefficient access to interconnection facilities.⁷⁹ The Legislature mandated California to build a middle-mile network specifically because federal and state data demonstrate a lack of both affordable last-mile end user broadband access and affordable middle-mile access.⁸⁰ Therefore, TURN recommends the Commission require the carriers to provide specific data on rates, terms or

⁷⁶ US Telecom Opening Comments at 4 (states that existing market rates will be useful to determine affordability, but fails to provide any data)(emphasis added).

⁷⁷ Verizon Opening Comments at 7-8.

⁷⁸ Comcast Opening Comments at 2, 12; AT&T Opening Comments at 8-9; SCE Opening Comments at 12; Charter Opening Comments at 15; But see, SANDAG Opening Comments at 7 (lack of competition throughout San Diego County); CCF Opening Comments at 5, 10 (high poverty areas mostly likely to have choice of one last mile provider due to lack of middle mile, no truly open access network in LA County).

⁷⁹ D.16-12-025 (I.15-11-007) at 98-99, 104, 151, FOF24 (lack of competition and expensive construction lead to expensive wholesale inputs including backhaul and middle mile)

⁸⁰ SANDAG Opening Comments at 7 (lack of competition leads to expensive services). *See also*, LCB Opening Comments at 1, 3 (existing middle mile is often times not affordable); Santa Clara County Opening Comments at 3,4,7 (existing middle mile is not affordable).

conditions of access to their existing middle mile network services or request data from last mile providers on their existing middle mile contracts.⁸¹

2. State-Owned Middle-Mile Affordable Rates

Once California deploys its own middle-mile network, it must offer access at affordable rates to last-mile providers. While TURN encourages the Commission to serve data requests for to obtain information about current market-based contracts for access to middle mile,⁸² commercial contract should not serve as the benchmark for setting the state-owned middle-mile access rates.⁸³ Most comments acknowledge that in many areas of California, especially high cost and isolated areas, current middle-mile costs can serve as a barrier to affordable and meaningful last-mile access.⁸⁴ Therefore, while current market rates may be useful to determine

⁸¹ CVIN Opening Comments at 3, 5 (claims it offers affordable middle mile services and acknowledges that “affordable rates” will need to be defined, but provides no data); GeoLinks Opening Comments at 5 (network owners should provide data because it will be financial advantageous to)); Small LECs Opening Comments at 2 (acknowledges relying on Middle Mile but provides no information on rates, terms or conditions); Race Opening Comments at 2,4 (won’t share confidential pricing information unless protected); Lumen Opening Comments at 3, 5 (answers questions about affordability with responses about capacity); None of the incumbent providers and cable companies provide any comment or data on this issue. Some carriers reluctantly agree that the Commission and other state agencies could issue a data request for the same information being requested by this Ruling. While the Commission may have to resort to a data request, that inevitably adds delay and another step in the process. Compare the comments of parties such as NBNCBC Opening Comments at 9, and Santa Clara Valley Opening Comments at 3-5 that provides data on their experience working with companies that purchase middle mile and notes that rates vary on a number of factors.

⁸² TURN Opening Comments at 4.

⁸³ CCABC Opening Comments at 5-6 (use feet on the ground data and contracts to get data); City of Los Angeles at 3 (detailed term sheets should be submitted); GeoLinks Opening Comments at 5 (network owners should be willing to give data about their contracts and pricing, in their best interest); SANDAG Opening Comments at 9-10 (not a lot of good data on current middle mile rates); EFF Opening Comments at 2-3 (suggests a broad range of sources for data on pricing).

⁸⁴ NBNCBC Opening Comments at 9; Cal Advocates Opening Comments at 11-12; California Broadband Cooperative (Digital 395) Opening Comments at 4-5 (CalTrans, permitting, endangered species make it all more expensive).

what is *unaffordable*, calculating rates for affordable state-owned middle-mile access must include elements such as the demographic and geographic characteristics of the community to be served and forecasted demand by the existing and projected last-mile end users.⁸⁵

3. Metrics To Determine What Is Affordable Middle-Mile Access

Parties propose benchmarks and formula to support affordable middle mile access such as the North Bay North Coast Broadband Consortium's (NBNCBC) suggestion to link middle-mile rates to "accommodate internet affordability in at least 98% of households in a geographic area."⁸⁶ Public Advocates suggests that last-mile providers should be charged not more than the "marginal cost" of maintaining the state-owned middle-mile network the last-mile provider accesses.⁸⁷ The Yurok Tribe proposes a specific rate for Tribal areas, and suggest specific rates for end users and wholesale providers.⁸⁸ While TURN urges the Commission to carefully review and refine these proposals, TURN generally agrees that rates for access to the state-owned middle-mile should be set to meet the needs of the last-mile end user communities the network intends to serve while also generating sufficient revenue from leasing access to the network that will support operational and maintenance requirements as well as capacity for future growth.

TURN agrees with parties that the ultimate determination of affordable middle-mile rates will incorporate the costs to build, operate and maintain the state-owned middle-mile network,

⁸⁵ San Francisco Opening Comments at 2 (look at opinion of potential network users to determine affordability); SANDAG Opening Comments at 8-9 (look at several factors); but see, EFF Opening Comments at 3 (suggestion that other sources of market based contracts could serve as a benchmark); CETF Opening Comments at 7, 10-11 (get all stakeholders together).

⁸⁶ NBNCBC Opening Comments at 9; CCABC Opening Comments at 7 (charge middle mile rates that allow for affordable last mile services and high rates should be passed on to low-income end users).

⁸⁷ Public Advocates Opening Comments at 8.

⁸⁸ Yurok Tribe Opening Comments at 6.

even if the rates are subsidized in some areas so that the network can serve high-cost areas and still offer affordable access to last mile providers. Parties provided many different perspectives on the design and capacity for state-owned middle-mile networks and each design decision will, in turn, drive costs.⁸⁹ As discussed in its opening comments and again in these comments, TURN supports calls for a flexible and “future proof” design, including redundancy and network resiliency for public safety, undergrounding facilities where appropriate, placing empty conduit, and reliance on “dig once/dig smart” policies that should reduce state-owned middle-mile deployment costs.⁹⁰ To ensure last-mile access to state-owned middle network is affordable and available to those that need it most, the Commission must support efficient use of public funds to build networks tailored to the needs of an area with clear and measured criteria for future growth and to invest in this network to enable last-mile service for the greatest number of Californians.

While no party argues that the state-owned middle mile must make a “profit,” some suggest the state agencies should consider a return on investment as it determines access rates or the need for users of the facility to take advantage of other funding sources, such as the loan loss reserve fund, to defray the costs of access to the facility.⁹¹ One of the benefits of the state-owned

⁸⁹ NBNCBC Opening Comments at 11 (recognizing that equipment and labor costs for higher fiber counts could add up).

⁹⁰ LCB Opening Comments at 3 (made sure to build in redundancy and resilience), and 5 (avoid waste, watch budget); Coachella Valley Association of Governments (CVAG) Opening Comments at 4-5 (look at transportation projects to put in conduit and place large capacity); SANDAG Opening Comments at 4, 9 (use transportation corridors and other public infrastructure and electric IOU projects) and at 5, 7 (urges sizing of network for significant future demand); California Emerging Technology Fund (CETF) Opening Comments at 3 (dig once dig smart, look at public infrastructure) and 5 (proper priorities will avoid wasting funds); CCF Opening Comments at 8 (look at 100Mbps symmetrical); Next Century Cities (NCC) Opening Comments at 5, 7 (100 Mbps is out of date, look at symmetrical gigabyte service); Race Opening Comments at 5-7 (technical specifications); Frontier Opening Comments at 4-5 (invest in the future and symmetrical speeds).

⁹¹ NBNCBC Opening Comments at 10 (state facility doesn’t need to make a profit); but compare LCB Opening Comments at 7 (suggest facility should consider its return on investment); Public Advocates at 8

middle-mile network is that the higher cost of deployment and maintenance in one part of California can be offset by lower costs of deployment and maintenance in other parts of the state. TURN agrees with NBNCBC and EFF that there should not be significant variation in rates for access to this facility between rural and urban areas. While some variation may be necessary, the variation should be data-driven, and the goal should be consistent rates for access throughout the network. This publicly-funded project should create affordable access to the state-owned middle-mile infrastructure, even if these goals must be achieved through subsidized rates that do not match costs in specific high-cost areas.⁹² Otherwise, last-mile providers may not deploy in high-cost areas if the cost to access state-owned middle mile is too expensive, and therefore the residents will continue to lack access to affordable and robust high-speed broadband services.

Some parties also urge the Commission to make a direct link between middle-mile rates and rates for end user services. These parties encourage the Commission to recommend specific conditions to be linked to the use of this publicly funded middle-mile network. SANDAG urges the Commission to gather data on costs of broadband subscriptions using “household level data maintained by ISPs” to analyze affordability of these last mile services.⁹³ Public Advocates and EFF propose that providers that use the state-owned middle-mile network should be required to

(only cost-based prices for access to facility); CETF suggests not to “overcomplicate” the affordable rate criteria and suggests charging rates that account for amortization of new capital investment and maintenance. CETF Opening Comments at 7. CCF Opening Comments at 7 (factor in access to loan loss reserve fund).

⁹² NBNCBC Opening Comments at 10; LCB Opening Comments at 8 (offset high costs by offering “incentives” to serve); CCABC Opening Comments at 5 (don’t penalize rural areas, make rates similar); Santa Clara County Opening Comments at 5 (subsidize high cost and low density areas even more so); EFF Opening Comments at 5,9 (rates for access don’t need to vary by geography is subsidizing those rates); CETF Opening Comments at p.7 ; *see also*, Race Opening Comments at 2 (rates should be benchmarked against rates at the “closest urban center”).

⁹³ SANDAG Opening Comments at 7.

offer a discounted last-mile residential service to qualifying households or partner closely with last mile providers targeting low income areas.⁹⁴ The Legislature specifically contemplated this option and directed the Office of Broadband and Digital Literacy to “consider adopting rules to encourage or require internet service providers that use the statewide open access middle mile broadband network to participate in the [state] lifeline program ... and the federal lifeline program.”⁹⁵ TURN agrees and urges the Commission, in its report to the Office of Broadband and Digital Literacy to advocate for rules that require participation in LifeLine for last-mile service providers using the state-owned middle-mile network.

TURN agrees with other parties that LifeLine may not be the only appropriate vehicle to ensure affordable end user residential services in areas with state-owned middle-mile facilities. TURN encourages Staff to recommend participation in other programs such as the Emergency Broadband Benefit (and its successor), California Teleconnect Fund, along with other specific and more tailored affordability programs and programs that offer digital literacy and outreach to communities that have suffered historic practices of redlining and Digital Redlining.⁹⁶ These

⁹⁴ NBNCBC Opening Comments at 5 (possible subsidy to carriers using network to provide affordable last mile services); CCABC Opening Comments at 7 (suggest a cost for end users based on income); Public Advocates Opening Comments at 11-12 (require provider using subsidized middle mile to offer low-income affordable service); Yurok Tribe Opening Comments at 6 (propose specific rates for end user services); EFF Opening Comments at 9-10 (partner with last mile providers that specifically focus on low income communities and those subject to digital redlining).

⁹⁵ Gov. Code §11549.56(b).

⁹⁶ See CETF Opening Comments at 10 (suggesting that specific conditions may not be necessary if enough participation in existing low-income programs and middle mile service rates are set appropriately to give the last mile service provider incentive to offer low income rates); *see also*, various LA County commentors about the need to make sure services affordable to end users to mitigate harms from redlining. County of Los Angeles Opening Comments at 4-5; LAEDC Opening Comments at 10 (discuss affordability in terms of end user household characteristics, CCF Opening Comments at 6, 11.

requirements will be necessary to support the public policy goals of this network and ensure increased access to meaningful and affordable high quality broadband access.

Several carrier parties oppose a link between access to the state-owned middle-mile network and requirements and policies for the last-mile services. Some attempt to distract the Commission from the relationship between the two issues by urging the Commission to defer last-mile issues to other state and federal programs such as CASF and new sources of last mile infrastructure funding.⁹⁷ While additional resources for last-mile access exist, the carriers' arguments to divide and separate these efforts should be dismissed in favor of efforts to efficiently and effectively coordinate public policy through each of these programs.

F. Building the State Middle Mile Network once Priority Projects are Identified

After a priority area is identified, the State should construct middle-mile network infrastructure that has the capacity to support current and future middle-mile service needs of the area. Several parties have explained that fiber strands and the electronics attached to them provide better information than the number of fiber strands alone,⁹⁸ others are more definitive in their number of strands that the State should require in its middle-mile network.⁹⁹ TURN

⁹⁷ CVIN Opening Comments at 6 (conserve funds for last mile, that is what will solve this problem); See, also CETF Opening Comments at 10 (access to low-income programs may mean last mile affordability need not be a consideration of middle mile costs).

⁹⁸ AT&T monitors needs and augments capacity using several approaches, such as upgrading the electronics used to light the fiber or lighting spare fiber strands. AT&T Opening Comments at 15. *See also* CVIN Opening Comments at 10-11.

⁹⁹ The comments reflect a wide range of fiber strands counts. *See e.g.*, Verizon Opening Comments at 11 (suggesting a 864-fiber count); LCB Opening Comments at 10 (suggesting no less than 72 strands, with additional suggestions for densely populated areas but confirming that the final numbers will be defined by the network design and engineering); Century Link Opening Comments at 6 (suggesting a minimum of 432 strands); Yurok Tribe Opening Comments at 10-11 (suggesting at least 144 strands but that may be more for more populated areas and ultimately should be managed through proper network design); Race

supports calls to secure future middle-mile service needs in all identified areas and suggests that this can only be done after conducting a network engineering analysis of the area and taking into account several factors,¹⁰⁰ including distance from the core and forecasted use of middle mile services.

Funding should be targeted for hardened middle-mile network infrastructure that meets the foreseeable middle-mile capacity needs¹⁰¹ of an area where privately-owned middle-mile network providers have not been motivated to invest. For this reason, the state-owned middle-mile network should not include fixed-wireless or microwave facilities¹⁰² for the provision of state-owned core middle-mile service. Similarly, as the cost-benefit analysis allows, additional conduit should be included for redundancy and maintenance purposes.¹⁰³

Opening Comments at 6. SCE suggests that the stand fiber count depends on location, and whether the fiber is needed closer to an Internet Access Point. SCE Opening Comments at 16-17.

¹⁰⁰ Verizon provides several considerations for the sufficient capacity analysis. Verizon Opening Comments at 11 (explaining that factors such as fiber cable sizing, number of last mile providers supported, services offered, conduit size). AT&T explains the reasons why and the ways that it already monitors capacity needs. AT&T Opening Comments at 14, 19.

¹⁰¹ The comments reflect strong support for scaling the state middle mile network to meet future needs. Verizon Opening Comments at 11 (suggesting deployment of additional conduit within each route for potential future expansion since digging the trench requires more investment than the conduit material cost). SCE suggests that for all leased arrangements (IRUs), the initial strand count, and the expansion of stand-counts should be included. SCE Opening Comment at 17. Lumen even states that spare conduit should be “routinely” installed regardless of the population density and distance from the core. Lumen Opening Comments at 7. *See also* GeoLinks Opening Comments at 10-11; Small LECS Opening Comments at 4; County of Los Angeles Opening Comments at 7.

¹⁰² Yuba County states that it is generally “preferable” for state deployed middle mile network be underground because the county area is prone to high fire risk and necessitates fire resilient middle mile infrastructure. CCABC Opening Comments at 9.

¹⁰³ Verizon Opening Comments at 11-12 and note 3 (suggesting additional conduit at critical intersections like railroads, bridges, and river crossings, and the use of the conduit to act as a duct that can support short term maintenance or secondary path for future augmentation or lateral work); LCB Opening Comments at 10 (suggesting at least two, and that they may be used for future damaged conduit replacement or future growth); Race Opening Comments at 7; Yurok Tribe Opening Comments at 10

TURN disagrees with industry suggestions that these issues are beyond the scope of the Commission's mandate and instead should be only addressed by engineering and design teams.¹⁰⁴ These suggestions take an overly simplistic view of the Commission's task at hand under the statute. As the Commission identifies areas to be served and prioritizes projects for its report, the Commission is right to seek comment about conduit capacity and fiber cable sizing to understand the areas with greatest needs and therefore, in need of closer consideration when prioritizing projects. Moreover, the Commission will likely find that identified areas with low commercial middle-mile network investment will include areas with low-population density, rural areas with last-mile service needed farther from the core networks, and even more densely populated areas that may be facing impacts of socioeconomic disparities. Each of these areas could benefit from hardened and scalable design through this state middle-mile network rather than through a privately-owned middle-mile network.

Finally, TURN agrees for calls to consider practices raised by commenters to interconnect at midpoints frequently, instead of requiring interconnection only at regeneration sites.¹⁰⁵ The latter may result in communities passed without connecting to the middle-mile network, an outcome that must be avoided as much as possible if California is to connect the most residents possible with the limited funding available.

(suggesting at least two connections and two routes in the event of an outage, break, or a natural disaster); CCABC Opening Comments at 9.

¹⁰⁴ AT&T Opening Comments at 19; Comcast Opening Comments at 5, note 11.

¹⁰⁵ Race Opening Comments at 6.

G. The State Middle Mile Project Should Leverage Broadband Work Undertaken by Other State and Local Agencies, Broadband Consortia, Tribes, and Broadband Providers.

TURN agrees with the parties that emphasized the importance of bolstering the efforts of the Commission and the California Department of Technology's Office of Broadband and Digital Literacy, by leveraging the ongoing broadband work being undertaken by other state and local agencies, Tribes, and other broadband stakeholders.¹⁰⁶ Leveraging the state-owned middle-mile project with other broadband planning and construction work can confer substantial benefits to both the state-owned middle-mile project and regional broadband projects (both middle mile and last mile). Specifically, coordination between the state-owned middle mile project and regional work can both improve the data available to the Office of Broadband and Digital Literacy and the CPUC, and reduce broadband construction costs. For example, Next Century Cities points to the work of the Massachusetts Broadband Institute (MBI) to partner with municipalities, thereby reducing costs and expediting broadband deployment.¹⁰⁷

The work being undertaken in the San Diego and Coachella Valley regions demonstrates the synergies between broadband deployment and transportation. As a regional transportation planning agency, SANDAG has incorporated digital infrastructure and broadband in developing and coordinating the regional transportation network. Transportation planning, paired with coordinated work to design the digital infrastructure necessary to support transportation, is the foundation of SANDAG's Digital Equity Strategy and Action Plan to coordinate the integration of fiber throughout the region, including transportation projects in areas that are unserved by

¹⁰⁶ Other stakeholders include, but are not limited to, telecommunications and broadband service providers, broadband regional consortia, and non-profits.

¹⁰⁷ NCC Opening Comments at. 6-7.

broadband. This effort prioritizes bridging the digital divide and ensuring equitable access to broadband.¹⁰⁸ SANDAG's work involves collaboration and coordination amongst local jurisdictions, Tribes, San Diego Gas and Electric, and the Southern Border Broadband Consortium. Similar work is being undertaken by the Coachella Valley Association of Governments (CVAG), comprised of ten city jurisdictions, four Tribal governments, and Riverside County,¹⁰⁹ and also in other areas of the state.¹¹⁰ The state-owned middle-mile project can benefit from building on the work already undertaken by those involved in these regional efforts.

Regions have accomplished a lot at the regional broadband levels to identify existing middle-mile facilities; additional routes for middle mile that are necessary to extend broadband service; the locations of disadvantaged, unserved or underserved communities; options to partner with other projects that can be leveraged to coordinate the deployment of fiber; and the location of existing fiber that might be available to support last-mile broadband in a region. For example, the NBNCBC provides extensive details about the location of existing fiber infrastructure and towers owned by public agencies and private operators that can be taken into consideration by the CPUC and the Office of Broadband and Digital Literacy in assessing routes for the state-owned middle-mile project.¹¹¹ Parties such as NBNCBC,¹¹² Mono County¹¹³, the Central Coast

¹⁰⁸ SANDAG Opening Comments at 2-4.

¹⁰⁹ CVAG Opening Comments at 2.

¹¹⁰ See e.g., generally, Central Coast Broadband Consortia (CCBC) Opening Comments at 1-2, NBNCBC Opening Comments at 7, CCABC Opening Comments at 2. See also, SANDAG Opening Comments at 4.

¹¹¹ NBNCBC Opening Comments at 4-6.

¹¹² *Id.*, at 2-4.

¹¹³ Mono County Opening Comments at 3-4.

Broadband Consortium,¹¹⁴ California Community Foundation,¹¹⁵ the Yurok Tribe,¹¹⁶ and the Rural County Representatives of California (RCRC)¹¹⁷ have drawn from years of broadband work to identify specific routes that should be considered for the state-owned middle-mile project. Collaboration with public and non-profit agencies and other stakeholders with extensive local and regional knowledge offers opportunities to expedite construction, collect vital information necessary to pinpoint the locations for constructing state-owned middle-mile facilities and improve existing maps.¹¹⁸

SANDAG¹¹⁹, CVAG,¹²⁰ and the California Emerging Technology Fund (CETF)¹²¹ point to the importance of "Dig Once, Dig Smart" policies and practices. "Dig Once" involves the coordination between state and local agencies (such as CalTrans and county agencies), electric investor-owned utilities and broadband providers to coordinate the placement of fiber with construction along roads and highways. As discussed in the comments of SANDAG, CVAG and CETF, regional planning agencies, broadband consortia, Tribes, IOUs, broadband providers, and non-profits are collaborating on Dig Once efforts.

The California legislature has just overwhelmingly passed AB 41, which provides guidance for the broadband projects supported by the Budget Act of 2021, including the state-

¹¹⁴ CCBC Opening Comments at 4.

¹¹⁵ CCF Opening Comments at 9.

¹¹⁶ Yurok Tribe Opening Comments at 3-4.

¹¹⁷ RCRC Opening Comments at 3.

¹¹⁸ NCC Opening Comments at 5.

¹¹⁹ SANDAG Opening Comments at 3-4.

¹²⁰ CVAG Opening Comments at 4.

¹²¹ CETF Opening Comments at 2-3.

owned middle-mile project.¹²² If signed by the Governor, AB 41 would require CalTrans to expand its Dig Once duties so that construction along state highways includes installing conduit capable of supporting fiber optic communications for areas prioritized by the California Broadband Council (Council).¹²³ AB 41 would also require CalTrans to consult with the CPUC and broadband providers. Further, AB 41 would require the CPUC, in collaboration with "other relevant state agencies and stakeholders," to maintain and update a statewide, publicly accessible and interactive map showing the accessibility of broadband in California, and would allow the CPUC to collect information from broadband service providers to establish and update this map.¹²⁴ In addition to supporting the state-owned middle-mile project, the AB 41 requirements complement the work that is being undertaken in various regions of California. As recognized by the Legislature, Dig Once policies and practices can support broadband deployment by reducing the cost and time needed to deploy fiber by eliminating duplicative excavation work along highways and transportation corridors.¹²⁵

In a document summarizing its research into existing broadband coordination policy and practices, CalTrans found that projects in other states involving state and regional cooperation reduced capital costs for communications infrastructure through resource sharing with non-profit

¹²² AB 41, "Broadband Infrastructure Deployment," An Act to Amend Section 14051 of the Government Code, and to add Section 281.6 to the Public Utilities Code, relating to Communications,(Wood, Aguiar-Curry, Dahle, Eduardo Garcia) Enrolled September 15, 2021, Assembly Floor Analysis, Concurrence in Senate Amendments, September 10, 2021, at 1. AB 41 was passed in the Senate September 10, 2021 on a vote of 76-0, and in the Assembly on September 10, 2021 on a vote of 38-0.

¹²³ *Id.*

¹²⁴ AB 41 Assembly Floor Analysis, Concurrence in Senate Amendments, September 10, 2021, at 1-2.

¹²⁵ *Id.*, at 1.

broadband providers,¹²⁶ combining water and broadband projects,¹²⁷ leasing of state-built conduit to broadband providers,¹²⁸ and achieving an estimated cost savings of 15.5 percent per mile on rural projects by following "dig once" practices.¹²⁹ Accordingly, the state-owned middle-mile project should build on the work already undertaken throughout California to the greatest extent possible.

III. CONCLUSION

TURN supports the assigned Commissioner's Ruling's inquiry and offers the recommendations provided herein and in TURN's opening comments.

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¹²⁶ Dig Smart, California Department of Transportation, September 2018, at 4. In Maryland this involves providing right-of-way-use free of charge to non-profits who provide fiber. Essentially, providing fiber is an "in-kind" payment for use of the right of way.

¹²⁷ *Id.*, at 4 and 9.

¹²⁸ *Id.*

¹²⁹ *Id.*, at 5.